AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

Claim 1 (currently amended): A method of manufacturing *n*-type semiconductor diamond, comprising:

a step of producing diamond incorporating *Li* and *N* by implanting *Li* ions into, so that 10 ppm thereof will be contained in, single-crystal diamond incorporating at least 10 ppm *N*; and

a step of annealing said diamond incorporating *Li* and *N* at a temperature in the range of from 800°C to less than 1800°C, under high-pressure conditions of at least 3 GPa;

whereby said diamond has a sheet resistance of not greater than 10^7 Ω/□.

Claim 2 (currently amended): A method of manufacturing *n*-type semiconductor diamond, comprising:

a step of producing diamond incorporating *Li* and *N* by implanting into single-crystal diamond essentially not containing impurities *Li* and *N* ions, and so that ion-implantation depths at which the post-implantation *Li* and *N* concentrations each are at least 10 ppm will overlap; and

a step of annealing said diamond incorporating *Li* and *N* at a temperature in the range of from 800°C to less than 1800°C, under high-pressure conditions of at least 3 GPa;

whereby said diamond has a sheet resistance of not greater than 10^7 Ω/□.

Claim 3 (currently amended): A method of manufacturing *n*-type semiconductor diamond in which *Li* and *N* ions are implanted into single-crystal diamond, the *n*-type semiconductor-diamond manufacturing method comprising:

a step of implanting the ions so that ion-implantation depths at which the post-implantation *Li* and *N* concentrations each are at least 10 ppm will overlap, and so that the *Li* and *N* sum-total dose is less than or equal to 5.0×10^{15} cm^{-2} ; and

a step of annealing the post-implantation diamond at a temperature in the range of from 800°C to less than 1800°C, under high-pressure conditions of at least 3 GPa;

whereby said diamond has a sheet resistance of not greater than 10^7 Ω/□.

Claim 4 (previously presented): An *n*-type semiconductor-diamond manufacturing method as set forth in claim 3, wherein an ion-implantation apparatus having an electron-beam line and two ion-beam lines is utilized to implant the *Li* and *N* ions simultaneously while radiating with the electron beam the single-crystal diamond that is ion-implanted.

Claim 5 (canceled)

Claim 6 (previously presented): Semiconductor diamond being *n*-type, incorporating, from a crystal face thereof to the same depth, at least 10 ppm of each of *Li* and *N*, and having a sheet resistance of not greater than 10^7 Ω/□.

Claim 7 (new): An *n*-type semiconductor-diamond manufacturing method as set forth in claim 2, wherein in said diamond-producing step:

the diamond is either Type IIa or undoped epitaxial diamond;

the *Li* ions are implanted at a dose of at least 3.0×10^{15} cm^{-2} and the *N* ions at a dose such that the *Li* and *N* sum-total dose is at least 7.0×10^{15} cm^{-2}; and

the *Li* and *N* ion concentrations where the ion-implantation depths overlap each are at least 1600 ppm.

Claim 8 (new): An *n*-type semiconductor-diamond manufacturing method as set forth in claim 3, wherein:

the diamond is either Type IIa or undoped epitaxial diamond;

in said implanting step the *Li* ions are implanted at a dose of at least 3.0×10^{15} cm^{-2} and the *N* ions at a dose such that the *Li* and *N* sum-total dose is at least 7.0×10^{15} cm^{-2}, and the *Li* and *N* ion concentrations where the ion-implantation depths overlap each are at least 1600 ppm.

Claim 9 (new): Semiconductor diamond as set forth in claim 6, wherein:

the diamond is either Type IIa or undoped epitaxial diamond;

the concentration at which *Li* and *N* overlap to the same depth is at least 1600 ppm; and

the sheet resistance is not greater than 1.4×10^4 Ω/□.